First off, thanks a lot for providing this information and the narrative of questions to us Nathan – things are really moving forward! I'll put my questions/comments below yours – and in a different (**Times New Roman - bold**) font.

Hi gang,

I've updated my HexSim baseline NSO scenario to incorporate feedback I got from several people.
Some of the changes include:

- The territory size is now 3 hexagons.

  Do hexagons have to be adjacent to each other (I'm assuming they do – and I think they should)? I don't think that each hexagon must touch the other two, but that they need to be connected.

- I've changed the minimum quality for a hexagon to be used for a territory to 35. The minimum quality for a territory overall is now set to 3 x 35 = 105.

- I am again stratifying resource targets by modeling region. This resulted from a conversation with Brian. However, I found it unrealistic to set the actual resource target based on the home range data that Dave put together -- those values were too large. I suspect this is because they reflect the total resource, whereas owls only consume a fraction of this total. So what I've done is to use the mean values to set the relative size of the resource target. I set the resource target to 250 for birds in the Redwood Coast region, and then scaled up from there.

- I have added the barred owl impacts on Survival.

- I have adjusted the dispersal stopping criteria to reflect the mean territory score (45.35) identified in Dave and Jeff's tables.

- I have raised the minimum score for repulsion to 30. This means that repulsion starts when a hexagon is scored 30, and I've set it to ramp up linearly to 90% at a hexagon of score 0.

  This seems about right – from the 3,790 NSO site centers evaluated, only 7.31% had mean MaxEnt hexagon (86.6 ha) values <20 and 16.91% had mean values <30.

- I've adjusted the home range size data to reflect the discussion between Brandan, Bob, and Brian.

I'm not convinced that we have it right yet, for the following reasons:

1. The overall population size may be a little high. I'm getting ~2000 female owls. This can be raised or lowered by shifting the resource targets up or down. See Baseline C PopSize.pdf.

Two thousand females doesn't seem too high to me. For the 1996 MaxEnt models we created we had a total sample size of NSO site centers of 2,858 *after* we thinned locations by not allowing any two locations to be closer than 3 km. With a 4 km thinning we ended up with 2,189 site centers. Although in some situations these locations probably do represent the same owl nesting in different places (during the time window we used, +/- 3 yrs I believe), the ending population of 2,000 doesn't seem outrageous to me at first glance. In addition to this, in a bit of an off-frame evaluation based on the analyses provided in Zabel et al. (2003; in which we correlated NSO numbers to habitat quality, and we found a pretty high correlation $r^2 = 0.79$ between actual and predicted number of owls) – we estimated the total number of NSO home ranges in LSRs and Congressional Reserves in the Klamath Province of n. CA to be 560 (assuming a 900 ha home range size).

Perhaps this is a naïve question, but in these runs are you trying to find a stable population over time or are you using the best current estimates and applying them to the long term (in which case we'd expect a fairly substantial decline from years 50-200; based on the fact that the current overall rate of population decline is estimated to be ~3%)?

2. The population distribution through the landscape may be overly skewed to the south. This results from again stratifying the resource targets by region. The northern regions have much higher resource targets. What I did was to set the resource target for the Redwood Coast to 250. Then I scaled to other regions up based on the mean **(median?)** home range size. For example, the Redwood Coast mean home range size is 14 hexagons **(isn't the maximum HR size 14 in the redwood coast, with the median being 6?)**. The Washington Olympics mean **(this is a maximum too)** home range size is 128. 250 x 128 / 14 = 2286, which is what I set the OLY resource target to. This may be the wrong scaling factor. See Baseline C DSA Trands.pdf and Baseline C Occupancy (100+).png.

I believe the values you used were maximums not means (or medians). Nontheless….Just a thought here…The redwood region is highly anomalous in many regards (habitat relationships, climate, prey, etc..). Perhaps it needs to be treated as such. That is, maybe the scaling for all areas other than the Redwood zone should happen using the home range

values estimated for the Klamath or West Cascades South (both have relatively small estimated home ranges, but both are also larger than the Redwood zone).

I'd be very interested in Bob's, Katie's and other folk's (who know much more than I do) input on the question of a distribution skewed to the south. My understanding is that, in fact, there are more owls in the south than the north – so we should expect a skewed distribution.

3.   The distribution of dispersal path lengths (stage 0 owls only) seems overly skewed to the right. I'm referring to the full path length in hexagons, not the ultimate displacement distance. The maximum allowed currently is 250 hexagons. See Baseline C Dispersal Path Length.pdf.

The shape of this dispersal distribution looks just about right on to me. The data from Thomas et al. (1990 – ISC report) suggest that an exponential decay function was observed – and so too did some data I analyzed years ago from NSO's in NW CA. (note, both of the examples I just referenced were based on the straight line, or displacement, distance and not the full path length).

I'm also attaching a table showing the observed frequency of home range hexagon qualities. See Explored Area Quality (100-250).txt.

Sorry to heap so much on you all.

Some things to consider are:

A.   The MaxEnt data may account for some of the latitudinal shift in hexagon quality (Jeff has said so). At the same time, a hexagon scored 90 on the Olympic Peninsula is not equivalent to a hexagon scored 90 on the Redwood Coast (according to Brian). So we probably need to scale my resource targets less dramatically.

B.   The dispersal stopping criteria is being used to halt dispersal when a single territory quality hexagon (score of 45.35 or more) is encountered. I'm also drawing path length from a uniform distribution set to [0, 250] hexagons. Together, these seem to be causing very few medium and long distance dispersal events. I could raise the stopping value, raise the minimum path length, both, etc. Any feedback on what this distribution should be shaped like? Note that the histogram I sent used a log scale.

Can you have the stopping rule for dispersing birds be a function of the mean score of three hexagons rather than the mean score of one? That might have the same effect as

raising the stopping value, but also have the stopping rule be a function of the value of a territory instead of hexagon.

That's it for the moment,

Thanks in advance for any feedback you might have.

Nathan